Fire Master Plan and Community Risk Assessment

Objectives:

Examine and research

all aspects of the fire department: operations, planning, fire prevention, public education, training, communications, apparatus, maintenance, human resources, station locations, budget, large scale emergency preparedness, and cost recovery from automatic aid agreements;

the possible alignment of services and resources, proactively respond to current and anticipated community needs, protect firefighters by ensuring appropriate and safe equipment and adequate staffing is available as required;

opportunities to adjust and revise the fire department's structure, share services to improve effectiveness, and implement cost efficiencies and cost avoidance.

- The words Strategy or Strategies are included 21 times in the request for proposals
- The fire plan report is about further improving the value of the fire service by presenting a strategy using principles of engineering practices, project management, six sigma, and lean six sigma, and improving public protection at a lower cost.
- Critical to the strategy is robust data gathering, including outcome data, to determine the best distribution of human and physical assets to protect the public.

A strategy is an integrative set of choices that positions an organization in a way that it can accomplish its vision.

- A strategy isn't a plan. Planning is things such as:
- We should build a new fire station in 10 years.
- We need to hire more staff.
- We need to replace trucks every 15 to 20 years.

A strategy is a theory and the theory that we are recommending is that gathering the right data and interpreting it objectively and correctly – especially outcome values – and making plans based on those results will improve public protection and reduce costs.

“In God we trust; all others must bring data.”

— **W. Edwards Deming**

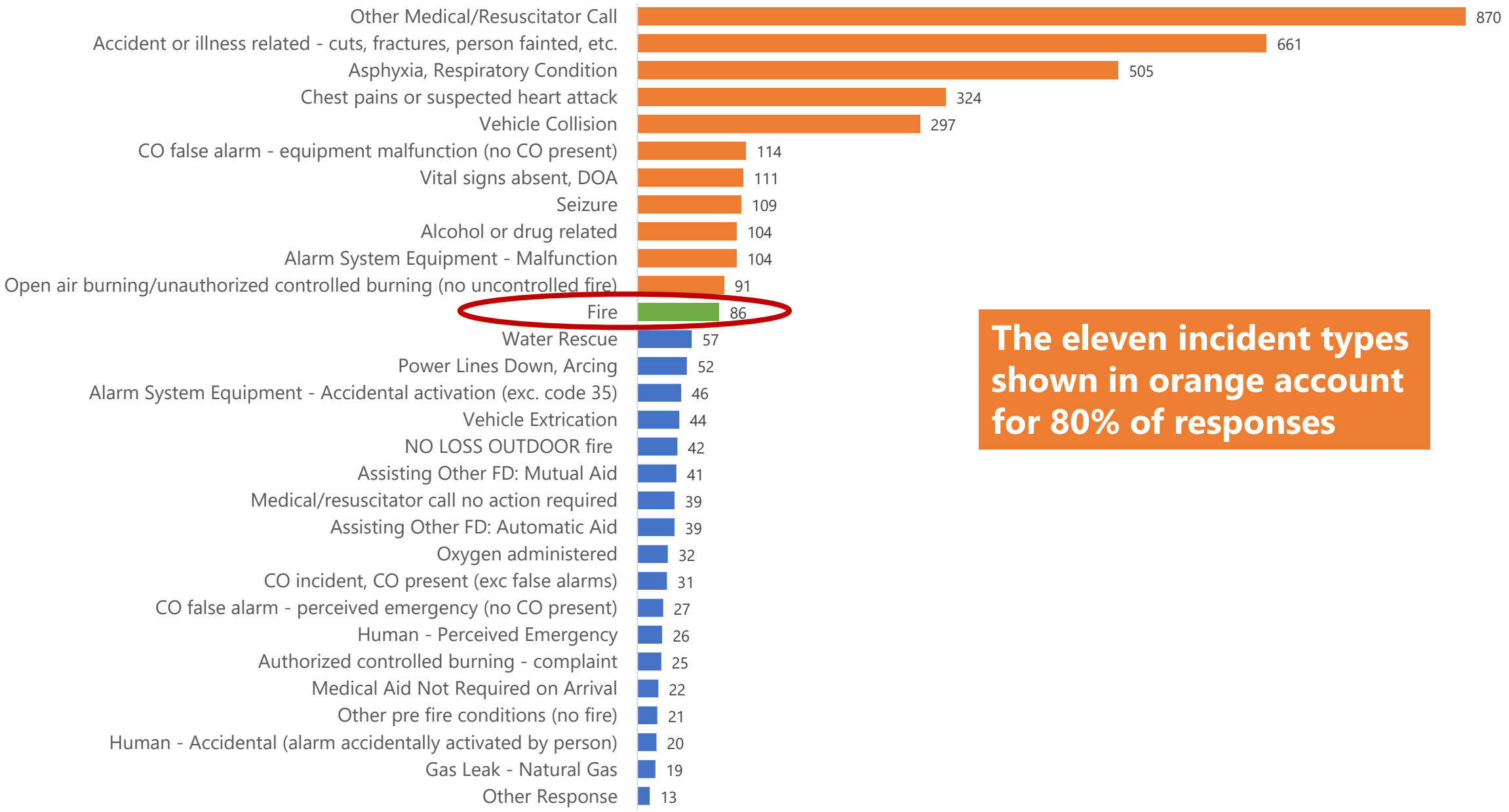
Data Limitations

Input Data	Output Data	Outcome data
Assets & resources: stations, vehicles, staff, equipment	Turnout time, driving time, number of firefighters responding or on scene	On scene activity, who did what, objective evaluation of benefit, subjective evaluation The Value Measurement
Almost always gathered	Often gathered	Rarely gathered; never in a database relative to input and output data

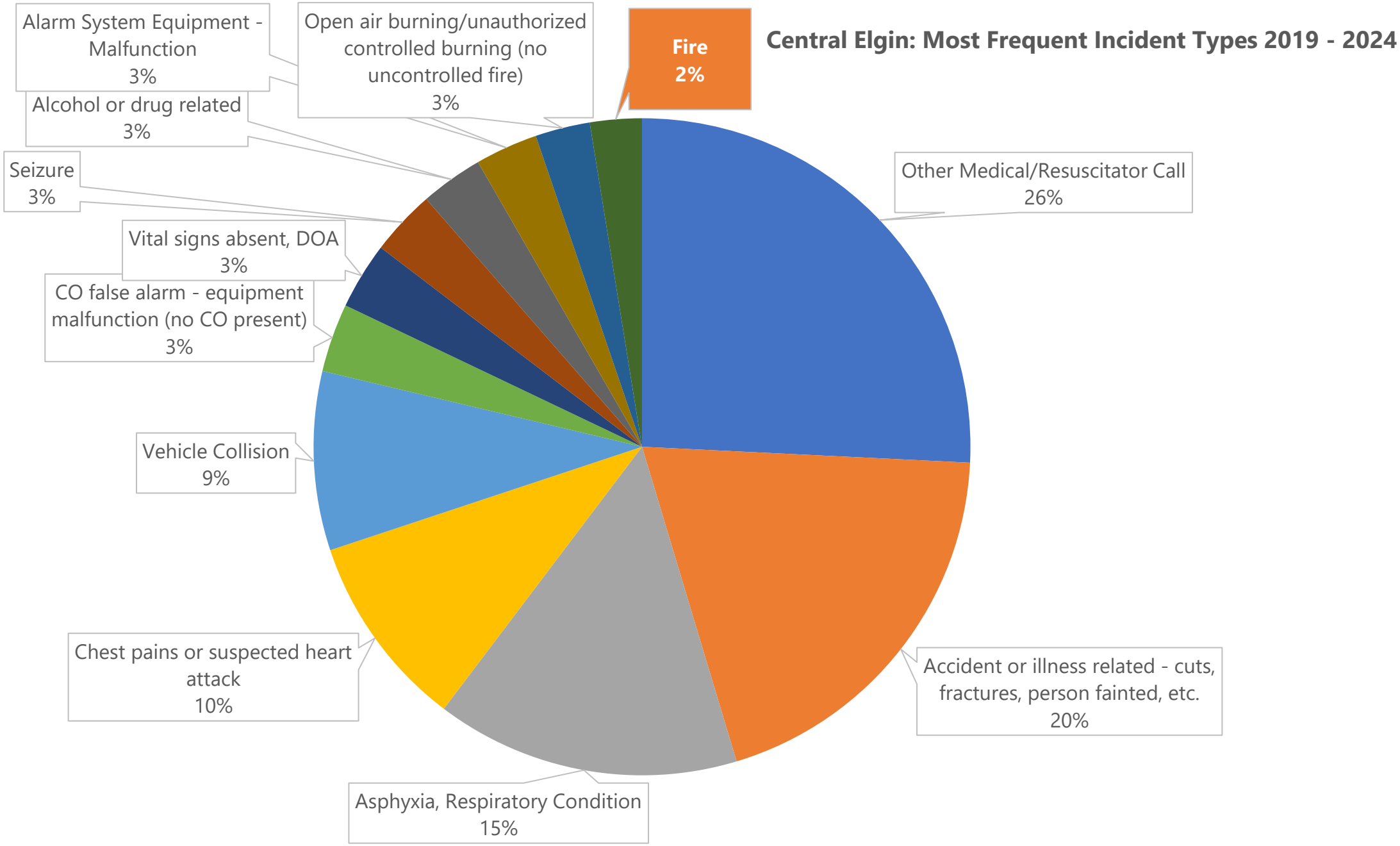
“Measures of productivity are like statistics on accidents: they tell you all about the number of accidents in the home, on the road, and at the workplace, but they do not tell you how to reduce the frequency of accidents.”

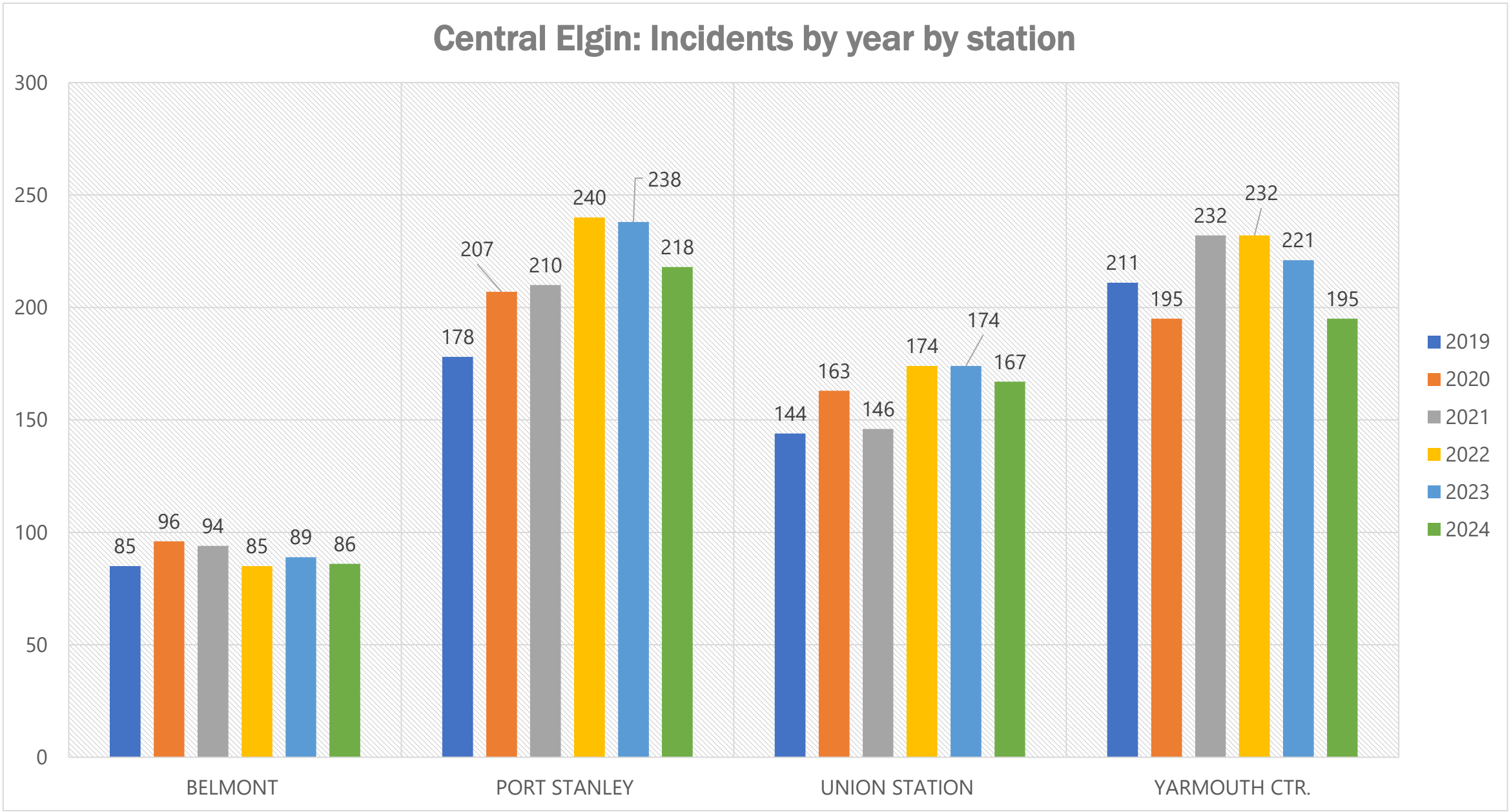
— **W. Edwards Deming, Out of the Crisis, reissue**

Central Elgin 2019-2024: Incident Types

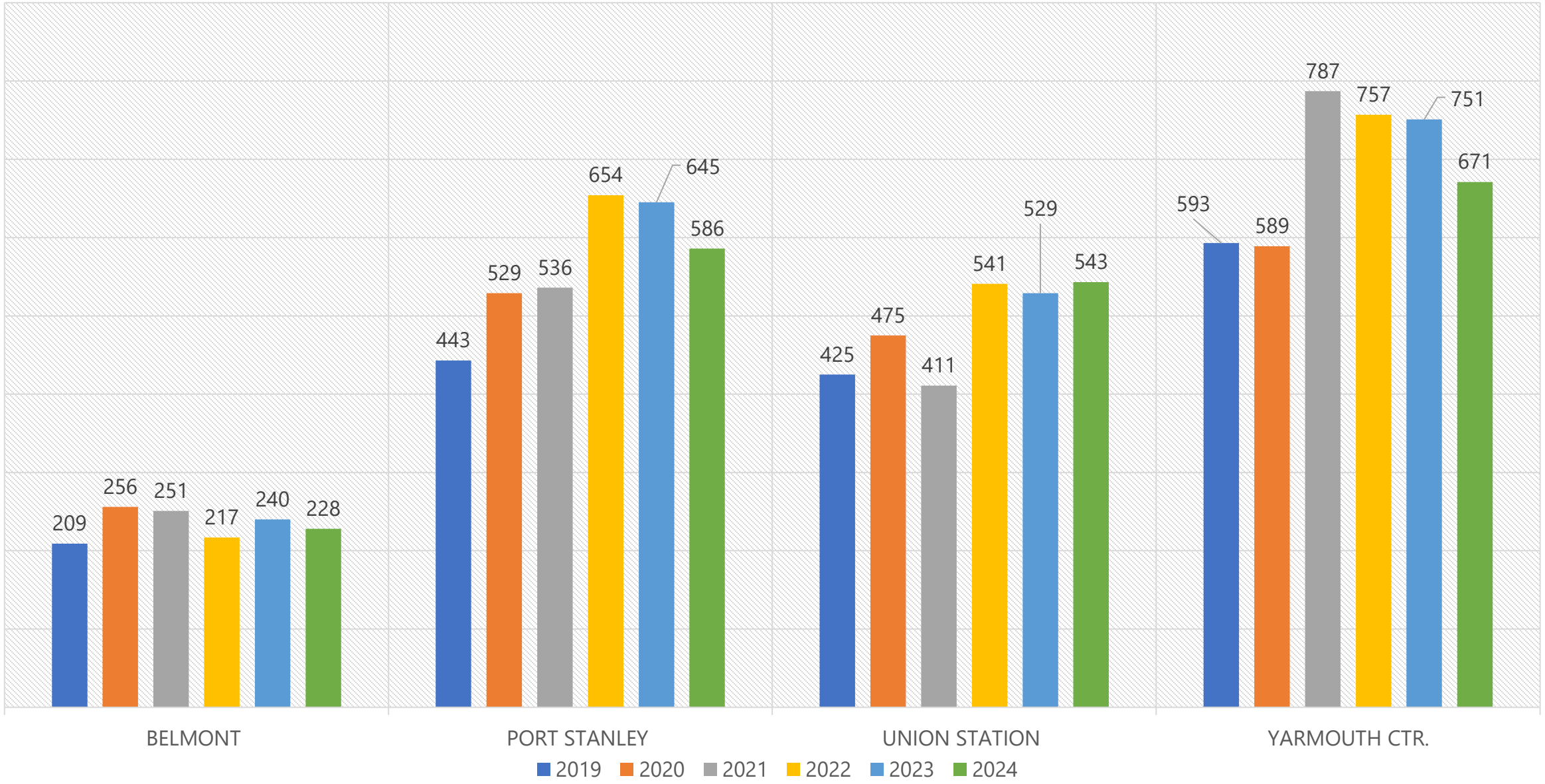


The eleven incident types shown in orange account for 80% of responses

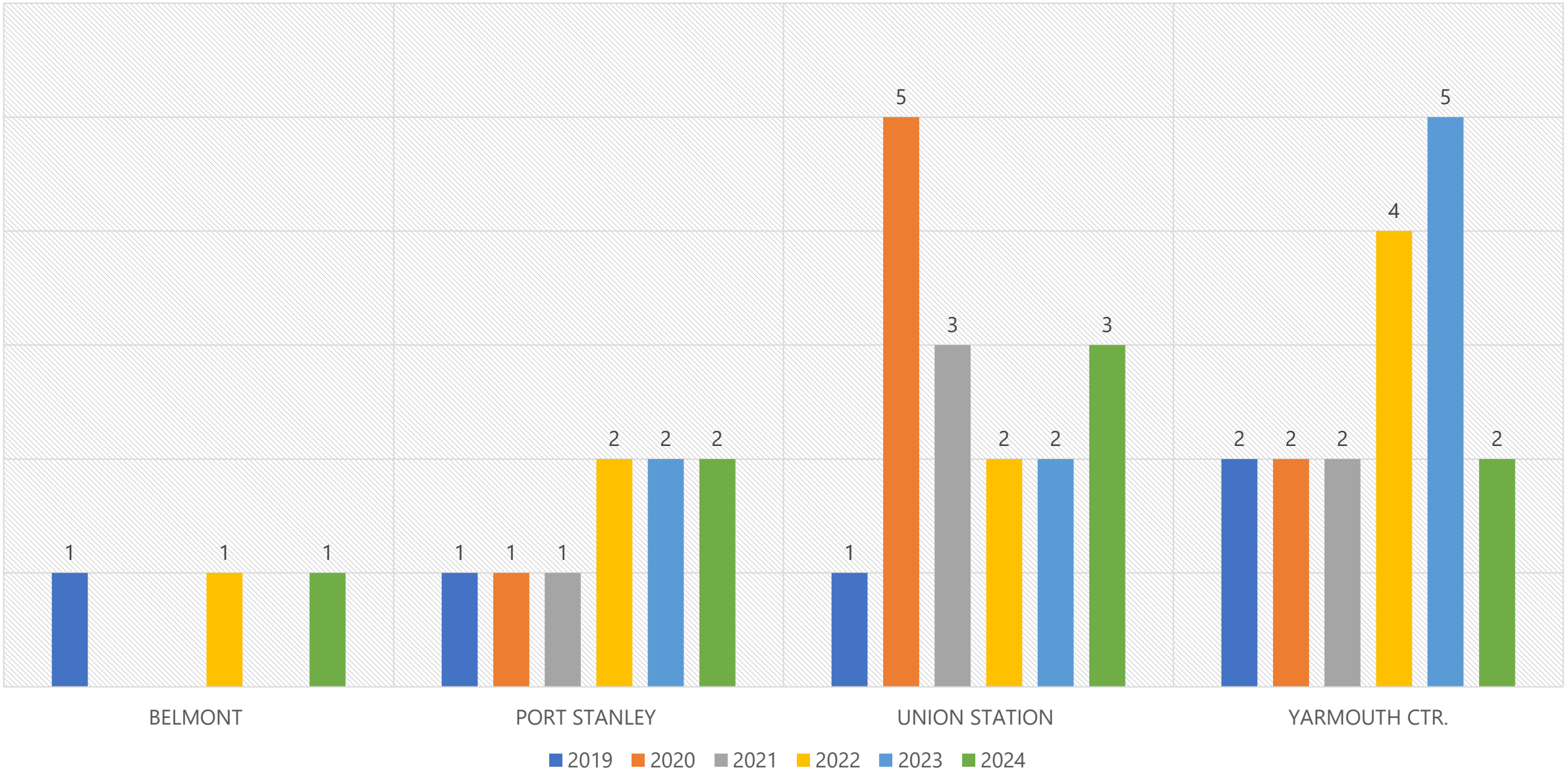

Central Elgin: Most Frequent Incident Types 2019 - 2024
Fire
2%
Other Medical/Resuscitator Call
26%
Accident or illness related - cuts, fractures, person fainted, etc.
20%
Asphyxia, Respiratory Condition
15%
Chest pains or suspected heart attack
10%
Vehicle Collision
9%
CO false alarm - equipment malfunction (no CO present)
3%
Vital signs absent, DOA
3%
Seizure
3%
Alcohol or drug related
3%
Alarm System Equipment - Malfunction
3%
Open air burning/unauthorized controlled burning (no uncontrolled fire)
3%


Central Elgin: Incidents by year by station
300
250
200
150
100
50
0
85
96
94
85
89
86
178
207
210
240
238
218
144
163
146
174
174
167
211
195
232
232
221
195
BELMONT
PORT STANLEY
UNION STATION
YARMOUTH CTR.
2019
2020
2021
2022
2023
2024

Central Elgin: Vehicles dispatched by year by station



Central Elgin: Structure Fires by Station



Turnout Cost per Incident and Total Annual Turnout Expenditure - All Incidents

	2019	2020	2021	2022	2023	2024
Number of Unique incidents	659	713	742	792	781	837
Average Number of Firefighters Paid per Incident	10	11	10	9	10	9
Annual Turnout Cost (assuming two hours pay per call)	$391,650	$432,415	$438,478	$432,473	$439,170	$451,007
Annual Total Staff Turnouts	6783	7489	7594	7490	7606	7811
Average Turnout Cost per Incident	$594	$606	$591	$546	$562	$577

Operational Cost per Call - All Incidents 2019 – 2024

based on the actual annual operational net expenditure for the fire rescue service

2019 - 2024	Incidents	Actual Operational Net Expenditures	Operational Cost Per Call
2019	659	$1,837,182	$2,787.83
2020	713	$2,164,106	$3,035.21
2021	742	$2,212,550	$2,981.87
2022	792	$2,091,520	$2,640.81
2023	781	$3,231,827	$4,138.06
2024	837	$2,881,033	$3,442.09

Turnout Cost, Medical and Vehicle Collisions, 2019 - 2024

	Total Incidents 2019 - 2024	Total Number of Firefighters That Responded	Average Number of Firefighters Responding per Incident	Estimated Response Cost - 6 Years	Average Annual Response Cost
Medical Incidents	2786	24664	8.9	$712,050	$118,675
Vehicle Collisions	297	3818	12.9	$110,226	$18,371

Medical incidents and traffic events accounted for 70% of fire department activity between 2019 to 2024, and 64% of turnout costs.

In comparison, in an interview with the City of Ottawa Paramedic Services in early 2024, we learned that only 17% of Ottawa Fire Services responses were to medical incidents.

Also stated in KPMG Review of Edmonton Fire Rescue Services, February 2021.

In Central Elgin, based on available records, paramedics arrive before firefighters 30% of the time.

Paramedics arrive within two minutes or less of the fire service in 44% of medical incidents.

In only 6% of cases were firefighters on scene more than 10 minutes ahead of paramedics.

Fire services, including Central Elgin, are “All Risk” services with only a small number of incidents being historically “fire related”.

But response to all incidents is based on general call outs in the same manner as if they are time critical emergencies.

Few incidents, less than 5% - 7%, are critical to the point that minutes and seconds make a difference.

Most events require one or two responders, rather than eight or nine.

Can response assets (firefighters, trucks, and equipment) be reconciled with need?

Technology Limitations

Historically, general call outs were the only way to ensure an adequate number of firefighters respond.

Selective paging (geolocating the closest responders to an incident or to a fire station) and paging only a few, has not been available until recently.

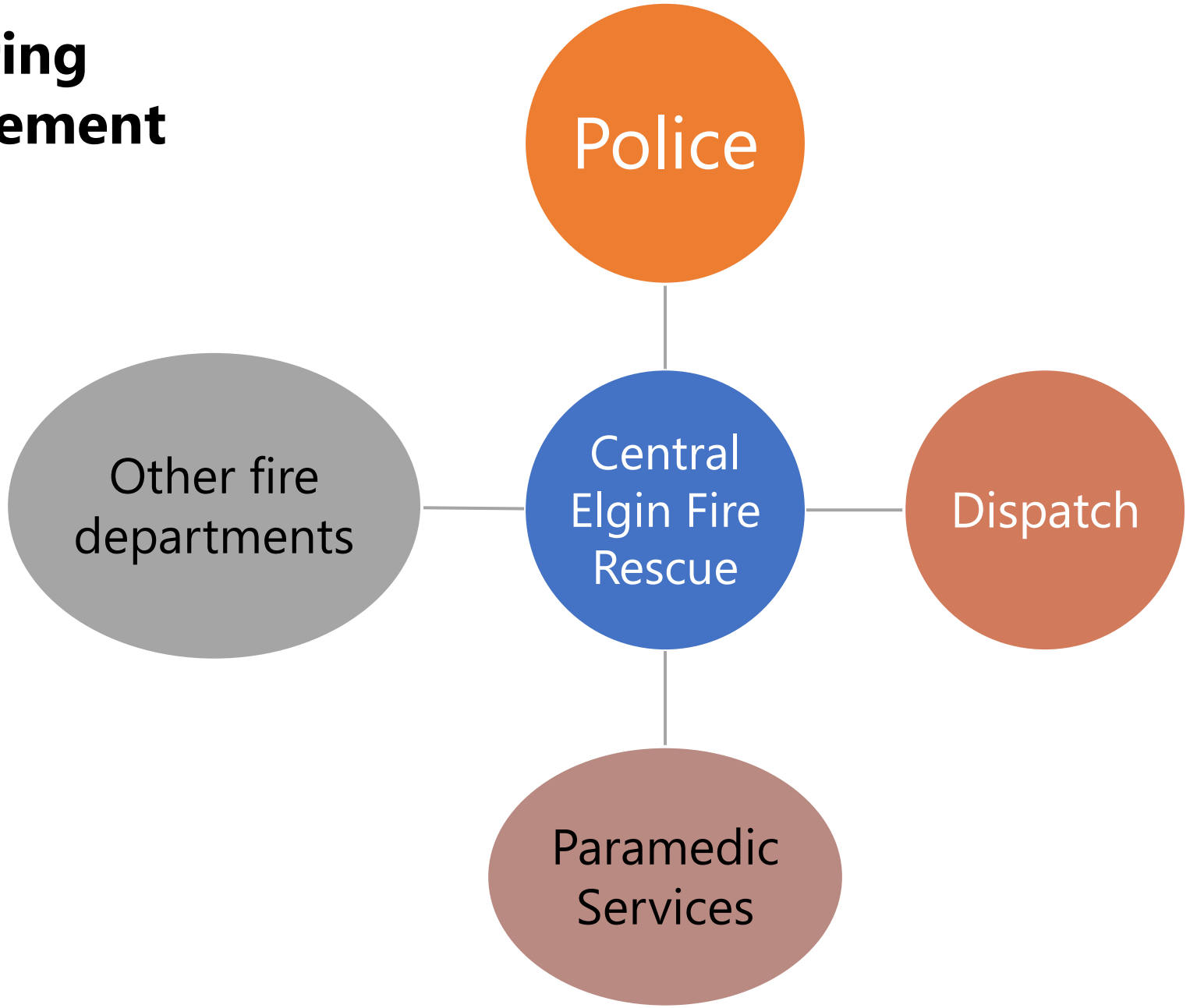
Fire services in Europe have been using selective paging for several years.

Paging applications such as *Onpage Incident Alert Management* will allow calling in only the required number of responders based on data gathered by call type.

•RECOMMENDATIONS

- Data gathering and measurement
- Service realignment
- Staffing

Data Gathering and Measurement



Data Gathering and Measurement

1. Develop a tabular relational database outcome utility within the fire department's record management system.
2. Implement a data gathering and data mining strategy that can examine the services provided relative to assets and resources expended.
3. Implement an Integrated Risk Management Planning program to objectively assess risk and, subsequently, refine firefighter call out practices to match resources to need.
4. Work with the Tillsonburg fire dispatch to take more time to extract information from callers which will reduce the number of people and trucks sent to incidents. Fewer than 15% of incidents, considered by the public and emergency workers to be emergencies, are time sensitive, and fewer than 5% are life threatening and require rapid response.

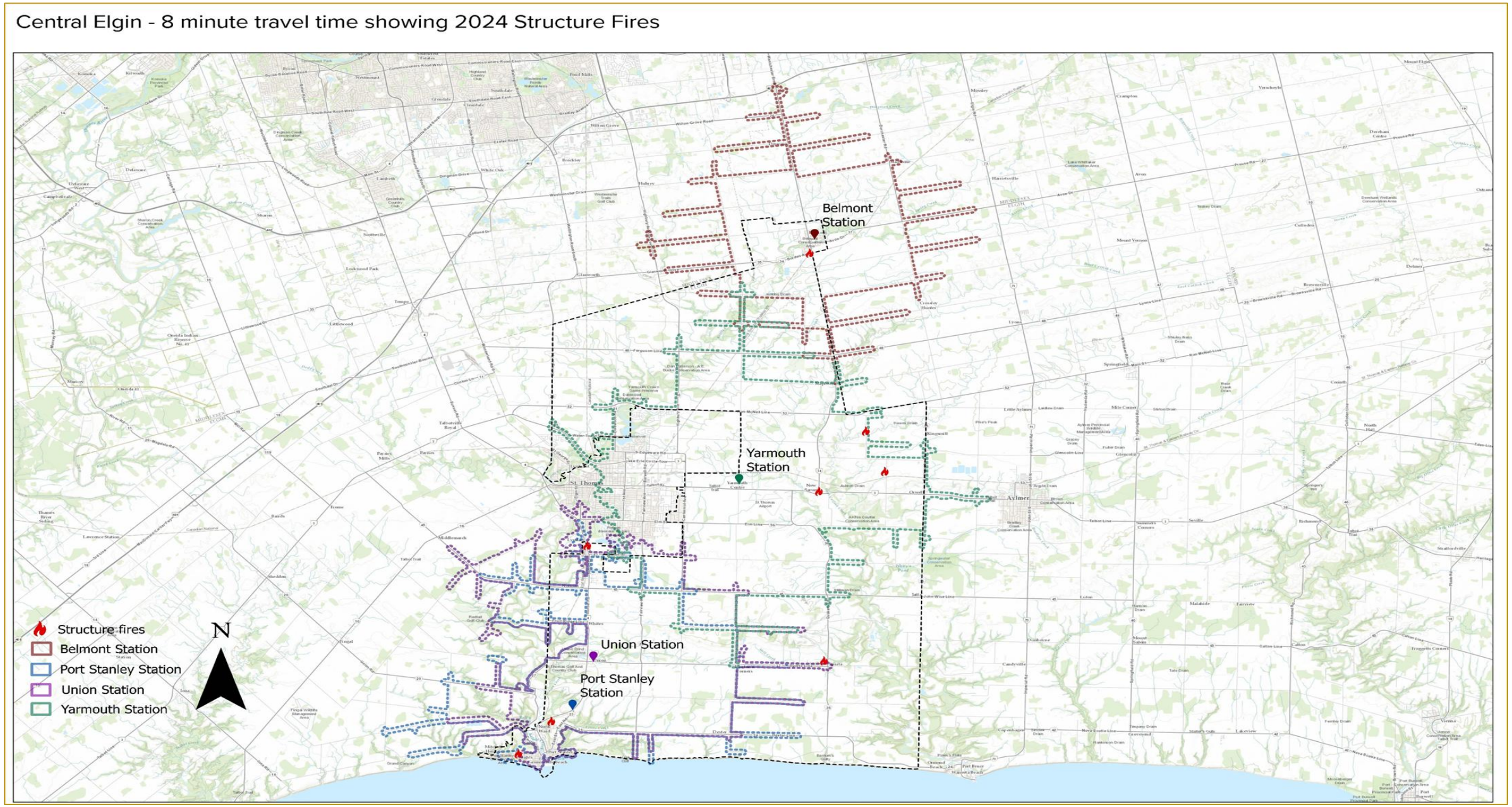
Data Gathering and Measurement

5. Work with the Tillsonburg fire dispatch and emergency partners such as police and paramedic services to ask key questions of callers before determining whether, or how, the fire service should be deployed.
6. Work with emergency partners such as police and paramedic services to define which non-fire events should be attended and understand the history of why fire departments attend a high proportion of non-fire events.
7. Examine, on a call-by-call and call type basis, resources deployed to determine whether patterns exist by which would allow assets and resources committed to be adjusted.
8. Reassess under what circumstances the fire department should be dispatched to medical and other non-fire incidents which make up more than 80% of the call volume.

Service Realignment

9. Use technology to reduce the number of firefighters responding to medical and other calls by using selective paging rather than general callouts. Medical incidents make up more than 60% of call volume. There are two paramedics in an ambulance and one in a paramedic response vehicle but four, six, eight, or more firefighters respond to medical incidents because all calls are dispatched through a general callout. Most medical incidents need no more than one or two firefighters. Onpage Incident Alert Management is one company that can offer geolocated selective paging rather than general callouts; there may be others.
10. Amalgamate the Union and Port Stanley fire stations, redistribute or sell Union station assets, redistribute rolling stock if there is a strong business case based on incident analysis for retaining some apparatus.
11. If the Union and Port Stanley stations are amalgamated, reduce the number of volunteers at the two stations by half through attrition.

Amalgamate Union and Port Stanley Stations



Staffing

13. Hire or contract a 24-hour a week part time training position.
14. Hire a full-time prevention and public education position which is expected to contribute to reducing structure and other fires in the municipality. The township will still require the efforts of volunteer firefighters to assist the prevention officer and achieve the objective of reducing fire incidents.
15. If no changes are made to the current incident and staffing response levels, assess hiring a deputy fire chief in 2028 to 2030 to assist with workload.

Estimated Financial Impact of Recommendations

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	10 Year Estimate
Service and Operations											
Work with record management system provider to implement outcome relational data gathering	$20,000										$20,000
Onpage selective paging	$37,500	$38,250	$39,015	$39,795	$40,591	$41,403	$42,231	$43,076	$43,937	$44,816	$410,615
Average cost of firefighter response (40% reduction)	-$309,949	-$331,305	-$354,132	-$378,531	-$404,612	-$432,490	-$462,288	-$494,140	-$528,186	-$564,578	-$4,260,212
Sub-totals Service and Operations	-$252,449	-$293,055	-$315,117	-$338,736	-$364,021	-$391,087	-$420,057	-$451,064	-$484,249	-$519,762	-$3,829,598
Staffing Recommendations											
Training Officer (part time)	$74,909	$76,257	$77,630	$79,027	$135,139	$137,572	$140,048	$142,569	$145,135	$147,748	$1,192,036
Prevention public education officer	$122,400	$124,603	$126,846	$129,129	$131,454	$133,820	$136,229	$138,681	$141,177	$143,718	$1,388,056
Deputy Fire Chief (May not be required, or may be delayed for several years, if call volume and number of responders initiatives described in this report are put into place)			$135,000	$137,430	$139,904	$142,422	$144,986	$147,595	$150,252	$152,957	$1,150,545
Sub-totals Staffing Recommendations	$197,309	$200,861	$204,476	$208,157	$266,593	$271,392	$276,277	$281,250	$286,312	$291,466	$3,730,637
Capital & Maintenance Recommendations											
Cell phones (amortized 6 years)	$75,000					$84,462					$159,462
Reduce overall purchase of bunker gear by 25 units every 10 years			-$100,000								-$100,000
Purchase three small SUVs every 7 years (section 7.7 of the report)	$153,000							$172,303			$325,303
Retire Union fire station - sell or repurpose for another municipal department		-$810,000									-$810,000
Union Station maintenance		-$16,000	-$16,320	-$16,646	-$16,979	-$17,319	-$17,665	-$18,019	-$18,379	-$18,747	-$156,074
Union station vehicle maintenance		-$16,573	-$16,904	-$17,243	-$17,587	-$17,939	-$18,298	-$18,664	-$19,037	-$19,418	-$161,663
Union station - avoid replacement costs of non-rolling stock		-$28,350	-$28,350	-$28,350	-$28,350	-$28,350	-$28,350	-$28,350	-$28,350	-$28,350	-$255,150
Sub-totals Capital and maintenance Recommendations	$228,000	-$870,923	-$161,574	-$62,239	-$62,917	$20,854	-$64,313	$107,270	-$65,766	-$66,514	-$998,122
TOTAL	$172,860	-$963,117	-$272,215	-$192,818	-$160,345	-$98,841	-$208,094	-$62,544	-$263,703	-$294,811	-$1,097,083